REMARKS

I. Amendments to the Claims

Currently, claims 4-8, 12-14, 16, and 37-53 are pending in the application with claims 4, 12, 16, 46, and 47 being the independent claims. Claims 9-11 and 18-36 were withdrawn, as being directed to a non-elected invention. Claims 4, 12, 16, 46, and 47 have been amended, and new claim 53 has been added. Claims 15 and 17 and withdrawn claims 9-11 and 18-36 were previously canceled without prejudice to their pursuit in an appropriate continuation or divisional application.

Support for the amendments to claims 4, 12, 16, 46, and 47 and for new claim 53 can be found throughout the specification and claims as originally filed, particularly on pages 8-16 and 18-27 and throughout the concurrently filed Preliminary Amendment, particularly in Example 7.

Additional support for the amendments to claims 4, 12, 16, 46, and 47 be found, e.g., on page 8, lines 3-22; from page 9, line 4, to page 12, line 14; from page 15, line 9, to page 16, line 6; and in the Examples. Additional support for the amendments to claims 4, 12, 16, 46, and 47 and for new claim 53 can be found, e.g., from page 12, line 27, to page 13, line 6; from page 18, line 25, to page 19, line 28; and in the Examples. Additional support for the amendments to claims 4, 12, 16, 46, and 47 can be found, e.g., from page 8, line 3, to page 9, line 22; from page 10, line 16, to page 12, line 14; on page 14, lines 19-23; from page 15, line 9, to page 16, line 6; on page 19, lines 17-19; and in the Examples.

II. Status of the Claims

Claims 1-36 were previously in the application. Claims 4-8 and 12-17 were elected in response to the Restriction Requirement. Claims 9-11 and 18-36 were withdrawn as being directed to a non-elected invention.

In the previously filed Amendment (January 22, 2007), claims 4-8, 12, and 16 were amended, and new claims 37-52 were added. Claims 15 and 17 and withdrawn claims 9-11 and 18-36 were canceled without prejudice to their pursuit in an appropriate continuation or divisional application.

Currently, claims 4-8, 12-14, 16, and 37-53 are pending in the application with claims 4, 12, 16, 46, and 47 being the independent claims. Claims 4, 12, 16, 46, and 47 have been amended, and new claim 53 has been added.

III. The Telephone Interview with the Examiner

Applicants respectfully requested a telephonic interview with the Examiner. Applicants wish to express their gratitude for the Examiner's willingness to grant a telephonic interview on October 19, 2007, notwithstanding the finality of the present rejection. Applicants thank the Examiner accordingly for extending this courtesy.

IV. Acknowledgement of the Priority Claim is Requested

This application is a continuation application of U.S. Patent Application 09/736,659, filed 14 December 2000, which is a continuation-in-part of PCT application No. PCT/US00/10230, filed April 14, 2000, which claims the benefit of priority under 35 USC Section 119(e) of U.S. Provisional Patent Application No. 60/129,191, filed on April 14,

1999; U.S. Provisional Patent Application No. 60/180,353, filed on February 4, 2000; and U.S. Provisional Patent Application No. 60/193,556, filed on March 31, 2000, all of which are incorporated herein by reference.

Applicants respectfully request acknowledgement of the priority claim accordingly.

V. Clarification Requested Concerning Withdrawal of Previous Rejections

Applicants thank the Examiner for withdrawing the rejection of claim 5 under 35 U.S.C. §112, second paragraph.

The Patent Office states:

> ....The prior art rejection under 35 USC 102(b) directed to claims 4-8 and 12-17 as being anticipated by Bloch et al is maintained and discussed. The claim rejection under 35 USC 102(b) directed to claims 4-8 and 12-17 is withdrawn in view of Applicant's amendment. [P. 2; par. 3.]

Claims 15 and 17 were canceled previously. Applicants respectfully request clarification as to the status of claims 4-8, 12-14, and 16.

VI. The Rejection of Claims 4-8 and 12-14 under 35 U.S.C. §102(b) over Bloch is Traversed, but Accommodated in Part

The Examiner has rejected claims 4-8 and 12-14 under 35 U.S.C. §102(b), alleging anticipation by Bloch et al. (U.S. Patent 4,789,630; filed 08/20/1986; issued 12/06/1988; "Bloch"). Applicants respectfully disagree, in part for reasons already of record.

The Patent Office alleges, in pertinent part:

> In response to Applicant's arguments, it is noted that the courts have established that during patent examination the pending claims must be interpreted as broadly as their terms reasonably allow *(In re Zletz, 893 F.2d 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989))*. In this case, the claims are broadly drawn to a kit comprising reagents, not a method. A kit does not impart functionality but rather only provides a compilation of materials. Such limitations as " for *indicating the presence of nucleic acid in a sample*" as recited in the claims is an intended use limitation of the claimed nucleic acid library that is not afforded any patentable weight because the limitation does not result in a structural difference between the claimed invention and the prior art. See *In re Casey,* 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto,* 312 F.2d 937, 939, 136 USPQ 458,459 (CCPA 1963). [Pp. 5-6; par. 6; all emphasis in original.]

Applicants have amended claims 4 and 12 in the interests of expediting prosecution. As currently amended independent claims 4 and 12 read as follows:

> 4 (currently amended). A kit for indicating the presence of nucleic acid in a sample, the kit comprising:
>
> a. a dry substrate for lysing cells and purifying nucleic acid therefrom consisting of:
>
> i. a solid matrix, wherein the solid matrix comprises nitrocellulose or nylon; and
>
> ii. a coating sorbed to the solid matrix, wherein the coating comprises a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; and
>
> b. an indicator for detecting the presence of nucleic acid, which is maintained on the solid matrix, the indicator comprising an external substance which generates a signal in an assay.
>
> 12 (currently amended). A kit for purifying nucleic acid comprising:
>
> a. a dry substrate comprising:
>
> i. a solid matrix, wherein the solid matrix comprises nitrocellulose or nylon; and
>
> ii. a coating sorbed to the solid matrix, wherein the coating comprises a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis;
>
> b. an indicator for detecting the presence of nucleic acid, which is maintained on the solid substrate, the indicator comprising an external substance which generates a signal in an assay; and

c. an integrity maintenance means for preserving the matrix and purifying nucleic acid.

Applicants respectfully submit that amended claims 4 and 12 recite the limitations as structural, rather than functional, elements.

In addition, as noted previously, Bloch is directed to Southern blotting, dot blotting, and similar techniques and applies purified DNA in an anionic detergent solution to a solid membrane surface for the detection of specific areas of the DNA or, alternatively, the use of such detergents to wash the solid phase after incubation for blocking purposes in order to reduce background with respect to analytical sensitivity (e.g., col. 20; lines 22-39).

For example, in Example 5, Bloch uses 0.5% (w/w) SDS in a prehybridization solution (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% (w/w) SDS, 0-10% (preferably 5%) dextran sulfate and 150 μg/ml denatured herring sperm DNA) (col. 33, lines 54-59) and 0.5% SDS (w/v) in a hybridization solution (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% (w/w) SDS, 0-10% dextran sulfate, 150 μg/ml denatured herring sperm DNA and 50-200 ng probe) (col. 33, lines 60-67).

In essence, this Example involves human **DNA, which has already been isolated, restriction digested, and electrophoresed before being transferred to a blot**. During the pre-hybridzation and hybridization steps, **when the Bloch blot is exposed to the SDS, it is wet, unlike the SDS-containing dry solid medium of the present invention**. The pre-hybridization and hybridization solutions are only 0.5% SDS.

In Example 5, detection takes place after rinsing the blot with Buffer A:

The probe-hybridized Southern blot from section II was rinsed once in 35 ml of phosphate –buffered saline (2.7 mM KCl, 136.9 mM NaCl, 1.5 mM

KH_2PO_4 and 8 mM Na_2HPO_4) to which had been added 0.1M NaCl and 5% Triton X-100 (Buffer A). [Col. 35; ll. 39-44; emphasis added.]

The final concentration of Triton X-100 is not provided, but the addition of 5% Triton X-100 to another solution would result in a final concentration of less than 5%.

Moreover, as noted in the Declaration of Dr. Walter King, Vice President of Research & Development of Whatman PLC, which Declaration is submitted herewith, the cellular lysis reagent of the present invention comprises an anionic detergent or surfactant. In contrast, Triton X-100 is a non-ionic detergent. Thus, Bloch makes no distinction between ionic and non-ionic detergents.

As noted in Dr. King's Declaration, the quantification of detergent with respect to lysis would be the measurement of the amount of nucleic acid, both DNA or RNA by enzymatic detection which are intracellular. In addition, the ability to measure these targets in this manner would be indicative of de-proteinization of the chromatin proteins which cover the DNA. At a low concentration of detergent, the amount of DNA detected would be lower and would increase with increased detergent concentration to a point, after which it would plateau. Other detergents, including those used in the emulsification of fats, could be used as biological detergents to lyse cells and solubilize cellular and membrane components.

As Dr. King's Declaration further states, there are differences with respect to non-ionic detergents Triton X-100 and NP-40. Brij 34, Tween 20, and Tween 80 are also examples of non-ionic detergents. Although they can lyse cells (particularly unfixed cells) in sufficient concentrations, these detergents generally are not as effective in lysis as ionic detergents.

In Example 6, cell lysis takes place in a tissue culture dish to which a lysis buffer (0.20 M LiCl, 0.020 M Tris CL, 0.001 M EDTA, 0.5% Nonidet P-40 and 0.05% aprotinin,

pH 80) has been added directly, followed by addition of an equal volume of 5% SDS, 1M dithiotreitol, 10% glycerol, 0.005% bromphenol blue, 0.125 M Tris Cl, pH 6.8 (col. 36, lines 40-47). Addition of an equal volume of a solution comprising 5% SDS to a solution comprising 0.5% Nonidet P-40 results in a solution of **only** 2.5% SDS and 0.25% Nonidet P-40, and **the lysis takes place in solution** in a culture dish – **not on a dry solid medium**.

Again, as noted in Dr. King's Declaration, the cellular lysis reagent of the present invention comprises an anionic detergent or surfactant. In contrast, Nonidet P-40 is a non-ionic detergent. Thus, Bloch makes no distinction between ionic and non-ionic detergents.

Moreover, the anionic surfactants of Bloch are directed toward facilitating use of the dye ion, rather than lysing the cells, and to the detection of DNA, for example, as part of a dot blot of previously isolated DNA or a blot of cells which are subsequently lysed by wetting with a separate lysis buffer, or after the DNA has been run on a gel.

For instance, in Example 9, the DNA is isolated, restriction digested, and electrophoresed prior to being blotted. In this Example, Bloch used 0.5% SDS in a prehybridization mixture (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% SDS, 5% dextran sulfate and 50% formamide) (col. 41, lines 57-60) and the same mixture containing two probes as a hybridization solution (col. 41, lines 62-65). The detection protocol of Example 5 was used.

In contrast, claims 4, 12, and 16 and the claims dependent thereon, are directed to a **dry** substrate, the **dry** substrate comprising a solid matrix **and** a coating **sorbed to** the solid matrix. With respect to the present claims, the "**cellular lysis reagent** comprising an anionic surfactant or detergent" is present "**at a concentration sufficient to induce cellular lysis**." Moreover, **at the concentrations sufficient to induce lysis**, the **enzymatic detection methods of Bloch** would be expected to be **inoperable** due to the denaturation of

the enzyme. The cells, blood, or other biological sample are brought into contact with the dry substrate, which itself facilitates cellular lysis. The nucleic acid is maintained on the solid matrix, where it is detected.

As discussed by Dr. King, the chemical coating of the present invention is dry. One could determine the mass of detergent dried per unit area of the membrane by comparing the coated and uncoated membrane. The concentration of lysis would be relative to the amount of liquid applied per unit area, (from which the mass of detergent would be known). However, "concentration" refers to the concentration with respect to the chemical coating "solution" applied to the matrix during preparation of the dry solid medium (see, e.g., p. 10).

The chemical coating solution of the present invention is described on pages 10-11 of the specification. The anionic detergent can be sodium dodecyl sulfate (SDS), but other detergents, such as alky aryl sulphonates, sodium tetradecylsulphate long chain (fatty) alcohol sulphates, sodium 2-ethylhexysulphate olefine sulphates, sulphosuccinates or phosphate esters, can be used in accordance with the invention. Although the concentration of the detergent can vary, it must result in a cellular lysis reagent when comprising the dry solid medium. The typical concentration range for SDS is 5%-10%, preferably 5%-7.5 "for coating particular glass microfiber" described in the specification. As Dr. King states, the chemical coating of the present invention is dry, and "concentration" refers to the concentration with respect to the chemical coating "solution" applied to the matrix during preparation of the dry solid medium (see, e.g., p. 10).

The Patent Office also alleges:

> Bloch et al teach wherein support comprising a polymeric anionic particles (col. 17, lines 52-68 to col. 18, lines 1-2). Bloch further defines wherein the anionic particle may include "polyacrylate, polymethacrylate, dextran, sulfate, sulfate glycosaminoglycan, polyglytamate, polyaspartate, carboxymethyl-cellulose, dextran and etc (col. 11, lines 12-19). [P. 7; par. 6.]

The specification of Bloch states:

....[The present invention] permits **controllable precipitation** of the meriqinone as solid salts of a wide range of anions, which salts under defined conditions are less soluble than the salts of acetate and phosphate ions commonly used in buffers **for meriquinone peroxidative staining applications**. **Solubility** is controlled by temperature, pH, **anion concentration**, total ionic strength, and **choice of anion**. [Col. 4, ll. 59-66; emphasis added.]

and:

As used herein, "controllable" is used to describe properties of the meriquinone-containing solid phase such as the solubility, color, crystallinity, and crystal size, which can be selected simply by **controlling the conditions under which the meriquinone is deposited in the solid phase**. For example, **solubility of the meriquinone salt** is controlled by **chemical identity of the anion**, **anion concentration**, pH, temperature, and total ionic strength of the medium. **Crystallinity and color** are determined by the **chemical identity of the anion**. **Crystal size** may be controlled by the **chemical identity of the anion**, temperature, **anion concentration**, and the speed with which meriquinone is generated by oxidation of benzidine or a substituted benezidine. [Col. 10, ll. 47-61; emphasis added.]

In addition to noting the range of "polymeric anions" listed by the Patent Office (see above), Bloch states:

As used herein, an "effective amount of an effective anion or polymeric anion" refers to the amount of an appropriate anion or polymeric anion which will cause formation of a solid salt or immobilized complex of the anion or polymeric anion with the meriquinone of the benzidine or substituted benzidine, which ever [sic] is used in the process, which salt or immobilized complex has a **meriquinone solubility below 10^{-5}M**. [Col. 11; ll. 20-27; emphasis added.]

and also

....Increased anion concentration and lowered reaction temperature favor salt precipitation or complex ion formation, with **anion concentrations of 10^{-3} to**

> **10^{-1} M** and reaction temperatures of 0 to 60 C being preferred. [Col. 17; ll. 12-16; emphasis added.]

As discussed by Dr. King, the present invention is directed to a kit comprising a cellular lysis reagent comprising an anionic detergent or surfactant. The present specification teaches that one example of a lysis reagent that can be used in accordance with the present invention is 5% - 10% SDS and notes that increased concentrations of SDS can provide "greater critical micelle concentration which generates greater lysing capability and thus greater yield of target nucleic acid" (p. 11.). At these concentrations, the enzymatic detection methods of Bloch would be expected to be inoperable due to inactivation of the detection enzymes. According to the Sigma catalog, Biochemicals, Reagents & Kits for Life Science Research, p. 2188 (Sigma-Aldrich Co., 2006-2007) (copy attached), SDS has a molecular weight (FW) of 288.38. Therefore, 5% - 10% SDS would be the equivalent of 0.17 M – 0.35 M, which would be greater than the 10^{-3}M – 10^{-1}M range of Bloch. (Again, the chemical coating of the present invention is dry, and "concentration" refers to the concentration with respect to the chemical coating "solution" applied to the matrix during preparation of the dry solid medium (see, e.g., p. 10).) Therefore, the disclosure of Bloch teaches away from the present invention.

In the present invention, the chemical coating is already sorbed to the matrix to result in a **dry** solid medium comprising the chemical coating, while Bloch describes the application of purified DNA in an anionic detergent solution to a solid membrane surface for the detection of specific areas of the DNA, or, alternatively, the use of such detergents to wash the solid phase after incubation for blocking purposes in order to reduce background with respect to analytical sensitivity (col. 20; lines 22-39). (Bloch reinforces the criticality of this point by the emphasis on the use of an integrity device that is intended to keep the membrane wet and prevent it from drying out [col. 35, line 68, to col. 36, line 1]. In contrast, the integrity maintenances means (e.g., a plastic bag) of the present invention has

the exact opposite purpose – namely, to keep the membrane dry to stop bacterial or fungal growth.) Therefore, the disclosure of Bloch teaches away from the present invention.

Claims 5-8 are dependent on claim 4, claims 13-14 are dependent on claim 12, and the same arguments apply to these claims as well, thereby rendering moot the remaining arguments alleged by the Patent Office.

As a result of the foregoing, Applicant respectfully submits that the present claims 4-8 and 12-14 fulfill the requirements of 35 U.S.C. §102(b) and requests the Examiner's reconsideration of these claims accordingly.

VII. The Rejection of Claim 16 under 35 U.S.C. §102(b) over Burgoyne is Traversed, but Accommodated in Part

The Examiner has rejected claim 16 under 35 U.S.C. §102(b), alleging anticipation by Burgoyne (U.S. Patent 5,496,562; filed 11/30/93; issued 03/05/96; "Burgoyne"). Applicants respectfully disagree.

The Patent Office alleges:

> Regarding claim 16, Burgoyne teaches a blood card (sheet or paper) comprising a dry solid matrix, wherein said matrix is a chemically modified cellulose, wherein the solid matrix further comprises a chemical coating functionally associated with the solid matrix, the chemical coating comprising a weak base, a chelating agent and an anionic surfactant or detergent which facilitates cellular lysis, an integrity maintenance means and indicator means, said card further comprising blood (col. 2, lines col. 47-64; col. 3, lines 1-6; col. 5, line 8-15 and Example 2). Therefore, Burgoyne meets the limitation of claim 16. [P. 8, par. 8.]

As noted previously, Applicants respectfully disagree with the rejection. For example, even prior to the present amendment, the ink stamp or pencil marking of Burgoyne (col. 5, lines 8-15) is not an indicator that detects or quantifies the presence of nucleic acid on the card. Rather, the ink stamp or pencil marking of Burgoyne is simply a label and is not involved in the actual detection of nucleic acid on the card.

In addition, amended claim 16 currently reads:

> 16 (currently amended). A blood card for labeling blood transfusion bags comprising:
>
> a. a dry substrate comprising a solid matrix selected from the group consisting of nitrocellulose, carboxymethylcellulose, polyester, polyamide, polytetrafluoroethylene and porous ceramics, wherein the solid matrix further comprises a chemical coating sorbed to the solid matrix, the chemical coating comprising:
>
> i. a weak base;
>
> ii. a chelating agent; and
>
> iii. a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; and
>
> b. an indicator for detecting the presence of nucleic acid, which is maintained on the solid matrix, the indicator comprising an external substance which generates a signal in an assay; and
>
> c. an integrity maintenance means.

The ink-stamp or pencil marking of Burgoyne is not an "indicator comprising an external substance which generates a signal in an assay."

In addition, as Dr. King states in his Declaration, Burgoyne discloses a "strong anionic detergent that binds to and denatures proteins" (col. 4, ll. 7-8), one that "will denature proteins and the majority of any pathogenic organisms in the sample" (col. 3; ll. 10-11). One of ordinary skill in the art would have expected the enzyme of the assay of the present invention to be denatured or otherwise inactivated upon contact with the "cellular

lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis."

As a result of the foregoing, Applicant respectfully submits that the present claim 16 fulfills the requirements of 35 U.S.C. §102(b) and requests the Examiner's reconsideration of this claim accordingly.

VIII. The Rejection of Claims 4-8, 12-17, and 37-46 under 35 U.S.C. §103(a) over Burgoyne in view of Ahern is Traversed in Part and Rendered Moot in Part, but Accommodated in Part

The Examiner has rejected claims 4-8, 12-17, and 37-46 under 35 U.S.C. 103(a) as "anticipated" by Burgoyne (U.S. Pat. 5,496,562) in view of Ahern (The Scientist, vol. 20, p. 105, 1995; "Ahern"). Applicant traverses the rejection, both with respect to anticipation and obviousness.

In the previous Amendment mailed January 22, 2007, claims 15 and 17 were canceled without prejudice, thereby rendering the rejection moot with respect to those claims.

The Patent Office alleges, in pertinent part:

> Regarding claims 4, 5, and 12, Burgoyne teaches a dry substrate consisting of a solid matrix comprises a cellulose-based paper (nitrocellulose) (col. 2, lines 21-25); a coating functionally associated with the solid matrix and wherein the coating comprises an anionic surfactant or detergent (col. 2, lines 59-64) and an indicator, which is maintained on the solid matrix, wherein the indicator is a color indicator (ink stamp or pencil marking) (col. 5, lines 8-15). Burgoyne does not teach wherein the dry substrate is packaged in the form of a kit.

> In a scientific article, Ahern teaches the advantages of a kit and provides motivation for combining reagents in the form of a kit. Ahern teaches that a kit provides convenience, time management and ease of practicing to the investigator (page 23, second-forth paragraphs). Therefore, in view of the teaching of Ahern, one of ordinary skill in the art at the time of the claimed invention would have been motivated to have provided the dry solid substrate as taught by Burgoyne et al in the form of a kit for the obvious benefits of convenience, time management and ease of practicing to the investigator as suggested by Ahern.
>
> ***
>
> Regarding claim 46, Burgoyne teaches a kit comprising a dry solid matrix, wherein said matrix is a chemically modified cellulose, wherein the solid matrix further comprises a chemical coating functionally associated with the solid matrix, the chemical coating comprising a weak base, a chelating agent and an anionic surfactant or detergent which facilitates cellular lysis, an integrity maintenance means and indicator means (col. 2, lines col. 47-64; col. 3, lines 1-6; col. 5, line 8-15 and Example 2). [Pp. 9-11; par. 10.]

As noted *supra*, Applicants respectfully disagree with the rejection. For example, even prior to the present amendment, the ink stamp or pencil marking of Burgoyne (col. 5, lines 8-15) is not an indicator that detects or quantifies the presence of nucleic acid on the card. Rather, the ink stamp or pencil marking of Burgoyne is simply a label and is not involved in the actual detection of nucleic acid on the card.

The ink-stamp or pencil marking of Burgoyne is not an "indicator comprising an external substance which generates a signal in an assay," as recited in the present claim language.

Similarly, as noted by Dr. King in his Declaration, Ahern discusses kits in a very general way, without disclosing an indicator for detecting the presence of nucleic acid, which is maintained on the dry solid medium of the present invention, the indicator comprising an external substance which generates a signal in an assay. In addition, one of ordinary skill in the art would have expected the enzyme of the assay of the present invention to be denatured or otherwise inactivated upon contact with the "cellular lysis

reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis."

Nothing in Ahern would suggest to one of skill in the art that it should be combined with Burgoyne, or *vice versa*, to produce the present invention (a kit comprising the dry solid medium of the present invention with the indicator of the present invention for detecting the presence of nucleic acid maintained on the dry solid medium).

Thus, there is no teaching, suggestion or motivation in Burgoyne or Ahern that would have led one of ordinary skill in the art to combine and/or modify these teachings to arrive at the claimed invention, nor is the present invention merely a variation on known work in the field of endeavor that one of ordinary skill in the art would have been predictable to one of ordinary skill in the art, nor is it chosen from a finite number of identified, predictable solutions, with a reasonable expectation of success. In the present invention, therefore, the improvement is more than the predictable use of prior art elements according to their established functions.

Applicant respectfully submits that claims 4-8, 12-14, 16, and 37-46 fulfill the requirements of 35 U.S.C. §102 and 35 U.S.C. §103(a), thereby placing these claims in condition for allowance, and request the Examiner's reconsideration accordingly.

IX. The Rejection of Claims 47-52 under 35 U.S.C. §103(a) over Burgoyne in view of Ahern and further in view of Bloch and Anderson is Traversed, but Accommodated in Part

The Examiner has rejected claims 47-52 under 35 U.S.C. 103(a) as unpatentable over Burgoyne (U.S. Patent 5,496,562) in view of Ahern (The Scientist, vol. 20, p. 105,

1995) and further in view of Bloch (U.S. Patent 4,789,630) and Anderson (U.S. Patent 5,589,154; "Anderson"). Applicant traverses the rejection.

The Patent Office alleges, in pertinent part:

> Regarding claims 47 and 52, Burgoyne in view of Ahern teaches a kit comprising a dry substrate comprising a solid matrix comprising chemically modified cellulose, the solid matrix being coated with a chemical coating functionally associated with the solid matrix, the chemical coating comprising a weak base; a chelating agent; and an anionic surfactant or detergent and an indicator means.
>
> Burgoyne does not teach wherein the indicator means comprises a polyethyleneimine conjugate or an ELISA.
>
> Bloch et al teach a kit and dry solid medium similar to that disclosed in Burgoyne et al. Bloch et al further teach wherein the dry substrate comprising a solid matrix, wherein said solid matrix is nitrocellulose (col. 17, lines 52-64) and wherein the dry substrate comprises an indicator comprising an enzyme linked immunosorbant assay (col. 12, lines 28-47; and col. 17). In a general teaching, Anderson teaches the advantages of using ELISA. Anderson teaches that ELISA has the advantage in that they can be conducted using inexpensive equipment and with a myriad of different enzymes, such that a large number of detection strategies can be used to quantitate the assay (col. 14, lines 27-38). Therefore, one of ordinary skill in the art at the time of the claimed invention would have been motivated to have included ELISA in the kit of Burgoyne in view of Ahern in view of Bloch based on the advantages taught by Anderson that ELISA can be conducted using inexpensive equipment and with a myriad of different enzymes, such that a large number of detection strategies can be used to quantitate the assay. [Pp. 11-12, par. 11.]

The teachings of Burgoyne, Bloch, and Ahern have been discussed, *supra*, and the same reasoning applies to this rejection. Burgoyne does not teach the indicator of the present invention, and Bloch and Ahern do not teach the dry solid medium of the present invention.

Moreover, the teachings of Anderson concerning ELISA do not remedy Burgoyne, Bloch, and Ahern.

Nothing in Ahern, Bloch or Anderson would suggest to one of skill in the art that any of these should be combined with Burgoyne, or *vice versa*, to produce the present invention (a kit comprising the dry solid medium of the present invention with the indicator of the present invention for detecting the presence of nucleic acid maintained on the dry solid medium).

With respect to claim 50, for example, as noted *supra*, according to the Sigma catalog, Biochemicals, Reagents & Kits for Life Science Research, p. 2188 (Sigma-Aldrich Co., 2006-2007) (copy attached), SDS has a molecular weight (FW) of 288.38. Therefore, 5% - 10% SDS in the chemical coating (prior to drying on the matrix [see, e.g., p. 10]) would be the equivalent of 0.17 M – 0.35 M, which would be greater than the 10^{-3}M – 10^{-1}M range of Bloch. In contrast, the present specification teaches that one example of a lysis reagent that can be used in accordance with the present invention is 5% - 10% SDS and notes that increased concentrations of SDS can provide "greater critical micelle concentration which generates greater lysing capability and thus greater yield of target nucleic acid" (p. 11.). Clearly Bloch teaches away from the present invention with respect to this claim and also teaches away from Burgoyne. One of ordinary skill in the art would not have been motivated to combine the teachings of Bloch with those of Burgoyne.

Thus, there is no teaching, suggestion or motivation in Burgoyne, Ahern, Bloch, or Anderson that would have led one of ordinary skill in the art to combine and/or modify these teachings to arrive at the claimed invention, nor is the present invention merely a variation on known work in the field of endeavor that one of ordinary skill in the art would have been predictable to one of ordinary skill in the art, nor is it chosen from a finite number of identified, predictable solutions, with a reasonable expectation of success. In the present invention, therefore, the improvement is more than the predictable use of prior art elements according to their established functions.

Applicant respectfully submits that claims 47-52 fulfill the requirements of 35 U.S.C. §103(a), thereby placing these claims in condition for allowance, and request the Examiner's reconsideration accordingly.

CONCLUSION

In view of the foregoing amendments and remarks, the present application is respectfully considered in condition for allowance. An early reconsideration and notice of allowance are earnestly solicited.

It is believed that all outstanding rejections have been addressed by this submission and that all the claims are in condition for allowance. If discussion of any amendment or remark made herein would advance this important case to allowance, the Examiner is invited to call the undersigned as soon as convenient.

Applicants hereby request a three-month extension of time. If, however, a request for an additional extension of time is required, the Examiner is respectfully requested to treat this as a conditional request for an additional extension of time. Although it is not believed that any additional fee (in addition to the fee concurrently submitted) is required to consider this submission, the Commissioner is hereby authorized to charge our deposit account no. 04-1105 should any fee be deemed necessary.

Respectfully submitted,

Kathryn A. Piffat, Ph.D.

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(October 27, 2007 = Saturday)

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